A PILOT STUDY OF THE COGNITIVE ABILITIES OF TWO YEAR OLDS WHO HAVE EXPERIENCED TEMPORARY FATHER ABSENCE

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ABSTRACT

Children raised in father absent environments are at a potential disadvantage, in terms of cognitive development. Father absence can not be avoided in some situations, such as during military service. This current study's aim is to test a particular research methodology. The goal is to examine and describe the affects of limited father absence on the cognitive performance of two year old children. A standardized cognitive screening test, the Cognitive Abilities Scale (CAS), was administered to a convenience sample of five two-year-olds, whose military fathers had been absent for a minimum of three months. All were children of college educated military officers. Subjects scored above the standardized mean for the test in terms of global cognitive abilities. As a result of the pilot, several methodological problems were identified; 1) the study of father absence was found to be a sensitive issue in the military setting, 2) problems were encountered in accessing two-year-olds, and 3) convenience sampling lead to a non-representative sample. Alternate methodologies are suggested to address these problems in future research. Health care providers can provide early assessment and initiate interventions for children at risk for negative cognitive effects from father absence.

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by

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DEDICATION

To the most important father in my life, my Heavenly Father, I dedicate this thesis. Without his strength and loving support this thesis would not have been possible.

I also dedicate this thesis to my earthly father, Roy E. Dick. Although not perfect, he provided me with a rich and meaningful childhood, and instilled in me a love of science and knowledge.

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CHAPTER ONE

Introduction

The purpose of this thesis is to pilot test a methodology to measure and describe the cognitive abilities of two year old children whose father's have been absent from their families due to military obligations, and to compare their cognitive scores with the known average scores of other two year olds. The broader focus of this study is to gain a better understanding of the impact of the father's role in fostering the optimal cognitive development of young children.

The impetus for studying this topic is derived from an observation of various social trends and attitudes. Social trends of concern include an increasing rate of single parent families, low levels of father involvement in child rearing activities, and situations in which the father is separated from the family because of work related duties. A cultural belief (and institutional attitude) that fathers are not a necessary or an important ingredient for early child development is perhaps contributory to the phenomenon of diminished father involvement as well.

The importance of the role of the mother in healthy child development is well established and accepted (Yarrow, Rubenstein & Pedersen, 1975). However, the contribution and impact that fathers have on child development has been minimized and the role of fatherhood has frequently been

considered superfluous in our culture (Bolton, 1986). Perhaps fathers could be encouraged to become more involved in child rearing if families and society gain a better understanding of just what the presence of an involved father can contribute to a child's development.

Background

The distinctive ways in which father's and mother's interact with their infant children have been shown to be quantitatively and qualitatively different (Clarke-Stewart, 1978; Field, 1978; Lamb, 1977a, 1977b). Clark-Stewart (1978) observed in a study of parent-infant behaviors that the father's role as 'playmate' increased between the ages of 15 and 30 months, with the mother spending more time in play at 15 months. By age 20 months both parents were equivalent in time spent in play. And by age 30 months the fathers were providing the majority of play time with their infants. Although mothers typically spend more total time in play with their infants at 15 months, fathers spend a greater proportion of their interaction time in play activities (Kotelchuck, 1976).

In several studies it has been observed that fathers and mothers play differently with their infants, in a qualitative sense (Clarke-Stewart, 1978; Field, 1978, Lamb, 1977a, 1977b). Fathers tend to provide greater physical stimulation, and use a greater degree of novel or unpredictable types of stimulation or interactive play activities than mothers do. According to Lamb (1981) "the

data consistently shows... that mothers and fathers represent different types of experiences for their infants" (p. 469).

Because both parental roles provide a different and unique addition to a child's environment, a lack of one parent (in this case, fathers) is not desirable if optimal development is the goal. In a study of 1,044 two year olds, Ricciutti & Scarr (1990) found that father absence was significantly associated with lower cognitive scores. Several thorough reviews of the research over the years has supported the conclusion that father absence, especially in the younger years, contributes to a lowering of intellectual or cognitive performance of children (Johnson,1993; Lamb, 1981a, 1986; Lamb & Stevenson, 1978; Pedersen, 1980; Radin, 1986; Russell & Radojevic, 1992; Robin, 1979; and Shinn, 1978).

Statistics from the 1990 census reveal a trend towards single parent families has occurred over the past two decades. Twenty five percent of children in the U.S. (14 million) are noted to be living in mother-only homes (Levine, 1993). This is up from 10 million as reported in 1976 (U.S. Bureau of the census, 1976). Thirty five to forty two percent of these children have little to no contact with their biological fathers (Seltzer & Bianchi, 1988). In addition, a trend has been noted of declining amount of time fathers spend actively involved with their children (Garbarino, 1993). As a result of the relative absence or lack of involvement of fathers, children are deprived of the

unique input of each parent.

Some social situations that contribute to the absence of fathers include: divorce, separation, desertion, and out of wed-lock births (including teenage births). Additionally, time and economic pressures on families that require multiple jobs to be held or long hours worked contribute to the relative lack of father involvement in child rearing. Yet, since the mid 1970's there has been a growing interest in fatherhood. Traditional roles have come to be questioned (Lamb, 1981a,1986; Parke & Tinsley, 1981; Russell & Radojevic, 1992). Are mothers the only parents who can provide nurturing care to young children? Is the father's role primarily to be concerned with providing economic support for his family? Do fathers always need to be the primary bread winner, and mothers the care givers? Can fathers be nurturing? Previously held assumptions about parental roles are being challenged, and perhaps reshaped or broadened.

Significance of The Problem

Early childhood represents an important time period for cognitive development. Papousek & Papousek (1975) state that early childhood "offers a very important opportunity to the child, one which may perhaps never appear again: namely, the opportunity to acquire and develop their capacity for cognition and communication" (p. 259). Because early childhood is crucial to cognitive development, situations that impact it are of special importance. One such situation

is the phenomenon of father absence. The causes of father absence are many; divorce, separation, desertion, out-wedlock births, economic pressures (requiring longer hours of work), job related separation, and military service. Children who have absent or minimally available fathers in their early years will not benefit from the varied and unique stimulation that fathers seem to provide. The additional and varied stimulation provided by the masculine approach of fathers is an important component to the environmental milieu of a developing child. As a result of paternal deprivation that occurs with father absence, children may not develop their cognitive abilities to the degree that children with present and involved fathers do.

Nurse practitioners, and other health care providers can have some useful impact on the problem of uninvolved fathers, or in situations when temporary father absence is unavoidable, as is the case in the military. When providing care or designing programs that serve children and families, special efforts can be made to include fathers in the discussions about care. Consistent inclusion of the father in these discussions and in the delivery of care may help to debunk the notion that fathers are not important or that they are not a significant figure in the development of young children. Nurse practitioners can educate families and fathers of the beneficial effects of father involvement. Practitioners, and institutions need to identify and change covert messages that they may be sending - that fathers are not important. Programs could be designed to overcome such

barriers as lack of self confidence in fathers, by specifically educating and supporting the parenting skills that fathers may feel they lack.

Statement of Problem

Children raised in father absent environments are at a potential disadvantage, in terms of cognitive development. Father absence can not be avoided in some circumstances. Fathers who are in the military are one example. This current study's aim is to test a particular research methodology. The goal of this line of study is to examine and describe the affects (or outcomes) of limited father absence on the cognitive performance of two year old children. The primary question being investigated is, will temporary father absence of at least three months negatively affect the cognitive performance of two year old children with military fathers? A secondary question being asked is during what age period does father absence exert a greater negative effect, during the first year or second year.

Conceptual Model

The conceptual framework upon which this study is based is called the confluence model. The development of this model and the empirical evidence from which it was drawn is described in detail in chapter two. In brief, the confluence model states that a family's configuration determines the 'intellectual environment' in which each child develops (Zajonc, 1976). According to the model, the intellectual

environment to which a child is exposed is a function of the number of parents, the number of siblings, and the spacing and ordinal position of each child. The model predicts that children with two involved parents benefit from greater intellectual stimulation than children with only one parent. With increasing family size the adult input is more widely dispersed and children experience less intellectual stimulation. According to the model, these differences in intellectual environments explain why children from father absent homes score lower on measures of cognitive abilities, and why scores decline with increasing ordinal position and number of siblings.

Definition of Terms

Father absence can occur for various reasons, desertion, marital discord, divorce, death, and temporary work related separations. Each of these types of father absence arise from a different set of circumstances, and represent differing experiences for families and children. One of the problems with previous research is that the operationalized definition of father absence has varied from study to study. For the purposes of this study father absence will refer to a limited, temporary (non-permanent) geographic separation of a father from his family for a minimum of three months during the child's first two years of life. The separation will be due to a temporary military related geographic dislocation. Despite the father's temporary absence from the family, he remains the primary economic supporter of the family, and no

change is SES occurs.

The term 'cognitive performance' represents an objective measurement of intellectual abilities. Here again, much of the earlier research has dealt with a variety of measures of cognitive ability or intellectual achievement (Fry, 1983; Goldstein, 1983; Tarantino & Loricchio, 1989). Researchers have used specialized developmental or intelligence tests as a dependent measure of intellectual abilities (Broman, Nichols & Kennedy, 1975; Clarke-Stewart, 1980; Ricciuti & Scarr, 1990). Others have utilized academic grades at various subsequent ages as measures of cognitive performance (Blanchard & Biller, 1971; Mulkey, Crain & Harrington, 1992; Solomon, Hirsch, Scheinfeld & Jackson, 1972). Still other researchers have relied upon direct behavioral observations for keys to determining the degree of cognitive ability (Pedersen, Rubenstein & Yarrow, 1979; Pedersen, Suwalsky, Cain, Zaslow & Rabinovich, 1987). To a large extent, the type of measurement is influenced by the age of the child being studied, and the specific research design being utilized. Some research has focused on outcomes (Blanchard & Biller, 1971; Fowler & Richards, 1978; Landy, Rosenberg & Sutton-Smith, 1969; Mulkey et al., 1992; Pedersen et al., 1979; Ricciuti & Scarr, 1990; Santrock, 1972; Sutton-Smith, Rosenberg & Landy, 1968) while other research attempts to define the dynamic processes that occur in parental interactions with children that result in differential outcomes (Clark-Stewart, 1980; Field, 1978; Lamb, 1977a, 1977b; Pedersen et al., 1987). For the purposes of this

study, cognitive performance will be defined as the total score received by each child on the standardized test called the "Cognitive Abilities Scale" (CAS).

The socioeconomic status (SES) of individual families will be defined as a function of the father's military rank and his length of military service. Using this information, each father's base pay can be calculated from published military pay scales.

The educational level of achievement of each parent will be defined by self-reporting on an ordinal scale. The scale consists of five levels of education, ranging from non-completion of high school, to a graduate degree (See appendix; Parent questionnaire/data collection form).

Limitations

No true control group of 'father present' children was incorporated in this study. Instead, the standardized scores of the measurement tool are used as a basis for comparison. Another limitation is the use of volunteer subjects instead of random sampling. A descriptive or correlational design is limited in its ability to determine cause and affect.

Assumptions

A major assumption of this study is that the father absence experienced by the subjects is due exclusively to circumstances beyond the family's control, namely, military deployment of the father. It would be expected that father absence as a result of death, divorce, separation, or

desertion would represent a qualitatively different experience to a child and family. Other interviewing variables would be present in those circumstances. It is hoped that a more realistic assessment of the effects of father absence will be obtained because the nature of father absence in the military setting is different from that which accompanies divorce or family break up, and is free of many of the accompanying intervening variables.

The degree of discord within the marriages of the subject families was not elicited or measured because of the intrusive nature of such an inquiry. The incidence of marital discord present within the sampled families is presumed to roughly reflect the population at large.

The quality or quantity of father-child interaction, while certainly a salient factor, was not measured or controlled in this study. It is assumed that the degree and quality of father-child interaction in this population is approximately the same as the greater population. Generally, the analysis of the impact of quality of interaction is accomplished through other study designs, and was not the focus of this present study.

It is assumed that the CAS will measure with some accuracy the cognitive abilities of the subject children (see chapter three for a discussion of the validity and reliability of the CAS). Consistent with the notion that a child's environment helps determine, in-part, developmental outcomes, this study assumes that greater levels of stimulation (as is expected in father presence) will result

in a specific developmental outcome. Conversely, a deprivation or reduction of stimulation will result in different developmental outcome. As stimulation increases, so to will cognitive development and performance. It is also assumed that the father's contribution to a child's development is qualitatively different from that of the mother's. Finally, it is recognized that a family's environment is dynamic. Interactions between parents and children are multi-faceted and complex.

Summary

To summarize, the purpose of this study is to pilot test a methodology to compare the cognitive abilities of father-absent two-year old children in the military setting with those of the general population. Growing changes in parental roles have brought a new interest in the study of fatherhood and the nature and impact of fathers on their children. A growing body of research is beginning to show that fathers contribute in unique ways to child development. It has been noted that children from father absent families tend to score lower on measures of intellectual ability or achievement (Blanchard & Biller, 1971; Fry, 1983; Mulkey et al., 1992; Pedersen et al., 1979; Santrock, 1972).

Nurse practitioners, and health care providers are directly involved in the care of young children and military families. They are in an excellent position to assess cognitive development and detect the negative aspects of father absence. By being aware of potential problems in

father absent families, providers may be able to identify those families who may require assistance, and provide extra education on child development, support for the parent, and facilitate other interventions or referrals when appropriate.

The confluence model provides a basis for viewing the contribution of the father to the intellectual environment of a child. The absence of the father in the family limits the quantity and the breadth of stimulation to which a child may be exposed. This, in turn, may negatively impact the child during an important period of cognitive development.

The next chapter will describe prior research on the topic of paternal influence on child development. A brief history of the role fatherhood in our culture is given. Research regarding the nature of father-infant interactions and how they differ from mother-infant interactions will be presented. A description and critique will be given of the theoretical model upon which this study is based, along with the empirical research from which the model was derived.

Next, the methodology and research design used in this study will be described. The development and testing of the CAS will also be presented as well, along with information on its validity and reliability. Analysis of the data will then be presented, along with the limitation inherent in such a small pilot study. Finally, the implication for practice and future research will be discussed.

CHAPTER TWO: REVIEW OF LITERATURE

Introduction

The literature pertaining to the parent-child relationship and its impact on child development is voluminous, and is dispersed over a thirty five year period. Even though a significant amount of study has been spent on this topic, it is still not completely understood. The sum of current knowledge about the father's effect on child development lags behind that which is known about the effects of maternal practices on child development. This is partly due to the scattered and varied approaches that have been used to study this topic. Still, a growing body of evidence is emerging that better defines the nature and effects of the father's role in child development.

This review will present some of the historical trends in the role and degree of father involvement, including a recent trend towards increased interest in father involvement in child rearing. Following this, will be a review of research and knowledge about the father-infant relationship. Finally, this perspective will then be broadened to examine the overall effects of father involvement (or more commonly, father absence) on various child development parameters. A brief discussion will be given to several child development areas that are affected by the father (or lack of a father). However, the main focus will be placed on the cognitive development and abilities of children and how they are

impacted by fathers. A review of one particular approach used by prior research, namely, an examination of the effects of 'father absence' will be provided.

One of the shortcomings of the past research has been that each researcher operationalized the concepts they were studying in different ways. Despite this, a cautious synthesis of the prior research delineates what fathers contribute (or do not contribute if absent) to child development.

Finally, a review of the conceptual or theoretical models of cognitive development will be given. Most attention will be given to a discussion of the confluence model.

Historical Trends in Fatherhood

Historically, beliefs and assumptions about the role of fatherhood have not remained static. Current assumptions of fatherhood or its elements have evolved over time. The current perspective on the role of fatherhood is by no means the most enlightened. Instead, the view of a father's role is shaped by the times in which one lives. Lamb (1986) reviewed the historical role of fatherhood in the American culture and has categorized four major periods that characterize the changing views on the role of fathers in the family.

When considering the colonial period and the early days of the country, one of the key roles of the father was to act as a moral teacher in the family. The set of values and

religious beliefs that children adopted was due in great part to the leadership of the father in this realm. The education of children, especially training the son's in the family trade, put the father in the center of the socialization role. He states, "good fathers were defined as men who provided a model of good Christian living and versed their children well in the Scriptures" (p. 5).

The next period that represents a change in the idea of what the father's role ought to be occurred around the time of the industrial revolution. In general, their was shift away from an agricultural or craftsmen based existence which fostered paternal involvement in the lives of children to one which distanced fathers from the socialization role they once filled. According to Lamb, the fathers' predominant role came to be associated primarily with providing economically for his family. Industrialization required long hours of work. Fathers became increasingly unavailable to their children. The mothers' role necessarily became one of a household manager, preoccupied with domestic and child rearing responsibilities. "Bread winning" became the defining characteristic "by which 'good fathers' could be appraised" (p. 5).

Following the great depression and the second world war, in addition to bread winning and moral leadership, an additional role was added. This was the notion that one of the key functions or roles of the father was to influence the sex-role development of his children.

Lamb (1981), in another work, cites several sources that

showed that the emerging social scientists of the early twentieth century promoted the notion that only mothers were qualified to nurture and care for children. They examined mothering behaviors in animal models, most interestingly rodents, and extrapolated their conclusions to humans. (It was later determined, however, that greater levels of paternal involvement exist in higher primate models.) These early researchers also cited as support for their position the fact that only females lactated, and therefore child rearing was biologically the female's domain. These cultural beliefs and assumptions have carried through to current times. As recently as the 1960's and 1970's the paternal role was seen in terms of providing financially for the family, and to a lesser extent, as a sex-role model for his children, especially sons.

Finally, as recently as the mid 1970's a new trend began to reevaluate the roles of men and women. Narrowly defined roles were questioned. Lamb points to examples of this shift in thinking as was exemplified in the movie *Kramer vs. Kramer*. Less rigid roles are now becoming accepted, and the assessment of a good father now includes characteristics like nurturance, still to some extent fathers see themselves primarily as economic providers, and mothers as nurturers and care givers (Lamb, 1981a,1986; Osofsky, 1979; Russell & Radojevic, 1992). Fathers may sometimes be seen as mother-substitutes, or helpers as they support or share with the mother the care taking responsibilities. It is in this context of changing roles and increased interest in the role

of fatherhood that research on the effect of father involvement (or absence) has occurred.

The Father-Infant Relationship

Sociobiologists initially placed an earlier emphasis on studying how maternal practices, and the mother-infant relationship influenced the intellectual growth of young children (Lamb, 1975). Less is known of the impact of fathers on developmental outcomes, although this is changing (Lamb,1981). Yarrow, et al.,(1975) provides a review of what is known about maternal influence on infant intellectual development. This will not be discussed except to illustrate differences between mothers and fathers in parenting styles.

Attachment Period

One of the earliest measures that researchers used in the study of the parent-infant relationship was the measurement of attachment behaviors. A major assumption has traditionally been held that an infant's primary attachment (and implicitly the only important attachment) is to his mother (Lamb, 1981). Lamb cites as a basis for this early assumption a study that found that "infants protested separation from their mothers more often than from their fathers around nine months, although by eighteen months most infants protested separation from either parent" (Lamb, 1981, p, 13). Since then, Lamb (1977a) in a longitudinal study of 20 infants found that as attachment behaviors first emerge (around six months age), no preference for mothers over

fathers was evident. However, between 7 and 13 months a slight preference emerged for mothers, although this preference was only evident when the child was placed in a stressful situation. In non-stressful situations, no distinction between fathers and mothers was discovered. This tendency to favor the mother diminishes during the second year of life, and is absent by 24 months of age.

These findings illustrate that the father-infant relationship develops at about the same time as the mother - infant relationship (6 to 7 months), and that except for a period of maternal preference (only evident in stressful situations) during the second half of the first year, infants seem to be bonded equally well to fathers as to mothers (Lamb, 1977a).

Mother-Father Differences in Infant Interactions

One might presume that fathers represent only one additional parental source of stimulation to an infant. But research has shown that paternal and maternal infant interactions differ quantitatively and qualitatively. The interaction that infants have with fathers is apparently different from that of mothers and changes as a child's age increases.

Differences in Quality of Play and Care Taking

Clark-Stewart (1978) conducted a well controlled longitudinal study utilizing varying types of data collection including home observations, laboratory situational probes,

maternal journal records, parental attitude questionnaires, and serial intelligence testing. Her sample consisted of fourteen volunteer families that were selected randomly from birth records and although somewhat small (14) represented a sampling of lower, middle, and upper SES families. All the families were white, and the mothers were the primary care givers and the fathers were employed full time. She noted that fathers tended as a group to provide greater physical and novel or unpredictable stimulation to infants. According to Clarke-Stewart, father's play was more likely to be physical and arousing rather than intellectual, didactic or mediated by objects - as in the case of mothers. "There are two biologically based and culturally supported interactive styles - a masculine style involving physical play and a feminine style involving care giving and conversation" (Clarke-Stewart, 1980, p.141). These conclusions are also reinforced by findings from other researchers (Field, 1978; Lamb, 1977a, 1977b; and Parke & Tinsley, 1981).

Field (1978), in a study of 36 middle-class, college educated families examined interaction behaviors of primary caretaker mothers, primary caretaker fathers, and secondary caretaker fathers. Primary caretaker mothers were defined as mothers who stayed home to care for their infant while the father was employed outside the home. Primary caretaker fathers were defined as fathers who stayed home to care for the infant while the mother was employed. Secondary caretaker fathers consisted of fathers who undertook the traditional role as sole bread winner while the mothers

stayed home with their infants. Primary caretakers, whether fathers or mothers, tended to adopt similar interactive patterns with their infants such as increased smiling, high pitched vocal imitation and mimicking of infant grimaces. She hypothesized that this similarity was due to the primary caretaker being more in-tune to cues from the infant.

However, Field still found characteristic differences between primary caretaker mothers, and both primary and secondary caretaker fathers. Both types of fathers engaged in less physically confining activities than mothers, and they engaged in more game playing. Lamb (1977a) also found similar differences in interactive patterns. He noted that mothers tended to hold infants more for care-taking activities, while fathers tended to physically hold their infants for the purposes of play. Taken together, these studies suggest that there are distinct differences in infant-parent interactions that are not just a result of who is the primary care taker, rather, there seems to be unique characteristic styles of interaction for fathers and mothers. "Fathers simply are not a mother substitutes: they do not mother, they father" (Radin, 1986, p.85).

Differences in Quantity of Play and Care Taking

Kotelchuck (1976) observed that mothers spend more time playing with their infants in absolute terms, but that fathers spend a greater proportion of their time in play than mothers. In Clarke-Stewart's (1978) longitudinal examination of this topic she noted that mothers spent more total time in

play with their 15 month old infants than fathers did. However, this difference had changed by the time the infants were 20 months of age, when fathers and mothers were noted to spend equal amounts of time in play with their infants. This trend continued as the children became older. Fathers were noted at 30 months to spend more total time playing with their infants than the mothers did. Over this same period of time there was a shift in care-taking activities. While at 15 months physical care needs were more often provided by mothers, by 30 months the time each parent spent in these activities was undifferentiated.

Given this information, it might be expected that varying degrees of father involvement would produce different outcomes in the child development process. This assumption relies on the notion that the environment plays a significant role in developmental outcomes. This brings into discussion the 'nature-nurture" question of child development. A more thorough discussion of developmental theories will be presented in a subsequent portion of this chapter.

Paternal Impact Child Development

The longitudinal study by Clarke-Stewart, described earlier, searched for maternal and paternal patterns of behavior that correlated most strongly with the intellectual competence of children. She noted, "the paternal variables most closely associated with children's intelligence were the father's engagement of the child in play, his positive ratings of the child, his anticipation of the child's

independence, and the duration of his interactions with the child in the natural observations" (p. 474).

In a sample of 55 inner city black infants aged 5-6 months, approximately half of whom did not have fathers present in the home, Pedersen, et al., (1979) found that male infants who lacked a paternal presence in their homes scored significantly lower on the Bayley Mental Developmental Index. However, female infants were not differentiated by this factor. This male-female difference in the effect of father absence on cognitive performance was thought by Pedersen et al., to be the result of the missing father. He had concluded this because he had not observed any significant differences between the behaviors of the single versus the married mothers in this study. Many other studies have been done which reflect similar findings (Bradley, Elardo, Rosenthal & Friend, 1984; Broman, Nichols & Kennedy, 1975; Pedersen, 1980; Pedersen et al., 1987; Ricciuti & Scarr, 1990), however, these two studies illustrate the influence of paternal interaction on infant development. This effect was noted in both a diverse SES white population (Clarke-Stewart, 1978), and that of a more homogeneous lower SES black population (Pedersen et al., 1979).

Many early correlational studies were conducted on children beyond the infancy period looking for the potential effects of father absence (Burton, 1972; Deutsch & Brown, 1964; Pedersen, 1966; Siegman, 1966). These early studies of father-absent children revealed differences from father present children in three broad areas; sex-role identity

development, social competency, and cognitive development. Several good reviews of literature on the study of father absence and the role of fathers in child development have been written over the years in books and journals highlighting what is known about paternal influence on child development (Johnson, 1993; Lamb, 1981a, 1986; Lamb & Stevenson, 1978; Osofsky, 1979; Pedersen, 1980; Radin, 1986; Russell & Radojevic, 1992; and Shinn, 1978). Because this current study is concerned primarily with only the cognitive parameter of development, only a brief review of the other two parameters (sex-role identity & social competence) will be presented here.

Sex-Role Identity Development

As far back as Freud's time, one of the recognized roles that fathers were thought to play was in helping to shape the gender-identity of their children (Burgner, 1985, and Chiland, 1981). Radin (1986) cites one study (Snow, Jacklin & MacCoby, 1983) that observed that fathers begin to promote appropriate sex role behavior in sons as early as 12 months of age. Lamb & Stevenson (1978) in one review state that "boys whose fathers are absent when they are very young are more likely to have difficulty adopting a masculine sex role than boys whose fathers are absent later" (p. 293). Radin (1986) notes that the father's influence on a daughter's sex role development is by a different mechanism. "By playing the male role, or the reciprocal role to the female role, fathers appear to teach daughters female sex-typed behavior"

(p. 78). Fleck, Fuller, Malin, Miller, and Ackerson (1980) "found that father's psychological absence or 'non-acceptance' was correlated with more frequent and indiscriminate sexual behavior in female daughters" (Johnson, 1993, p. 302).

Social Competence

Socialization is another area that seems to be impacted by the presence or absence of paternal influence. Radin (1986) refers to a study by Easterbrooks & Goldberg (1984) that found that increased paternal involvement was related to more persistent and self-directed behavior in children. Radin states, "for both boys and girls, a relationship exists between paternal participation and the children's social competence" (Radin, 1986, p.81).

Anderson (1968) and Siegman (1966) found that conduct disorders and problematic behavior in boys was significantly related to the presence or absence of a father or a father substitute in the home. Johnson (1993) stated that "father absence in childhood contributes to more profound deficiencies in character formation, and higher rates of behavior problems" (p.302).

Parish & Nunn (1983) noted that children who experience father absence at an early age displayed an externalized locus of control. In simple terms an externalized locus of control represents a sense that one's own life experiences are the result of outside circumstances beyond the individual's control. This is in contrast to an internalized

locus of control which denotes a sense that one self is in control of what happens to him or herself.

Father Absence and Cognitive Development

Finally, the impact that paternal influence has on cognitive development has been studied by numerous researchers over the years. These studies frequently utilized different methodologies and measured different parameters of intellectual development at varying ages. Each study must be taken in its own context; however, taken together, the research suggests that paternal influence provides a unique contribution to a child's cognitive developmental environment, and that differing levels of paternal input may be expected to result in differential cognitive outcomes.

Many of the early studies on father absence were conducted in the 1960's, perhaps in response to changes in traditional family compositions and societal practices like divorce. Sutton-Smith et al., (1968) studied the scores of college entrance exams of 1,055 college sophomores. The sample population had little variability on a measure of SES, and 39% were from homes where a father was absent. Sutton-Smith et. al noted a "dramatic" effect of lower scores for the father absent students, both males and females. However, the effect was noted more uniformly for males than for females. These researchers noted that father absence during the early and mid childhood years (0-4, and 5-9 years) seemed to represent the most salient period for the effects of

paternal absence. An interesting finding of this study was that the father absence in the early years was most often attributed to the father's military service in the Korean War. The authors of the study speculated that "father absence interacts critically with the child's stage of development" (p. 1219).

Another similar study (Landy et al., 1969) looked at the college entrance exam scores of 100 female college students whose father's worked night shift during various periods of their childhood and some whose fathers were absent. The predicted negative effects of partial father absence (night shift work) became evident only in the subjects who experienced early and prolonged periods of partial father absence (night shift working fathers). Subjects whose fathers had begun night shift work after they had reached age ten had the highest scores, especially on the quantitative measures. Landy et al., reasoned that father unavailability and father absence were only two points along a continuum of father involvement.

This notion of paternal effects occurring along a continuum was reinforced by Blanchard & Biller (1971) who measured the academic achievement of 44 third grade boys. Subjects were divided into four groups; early father absence (beginning before age 5), late father absence (starting after age 5), low father presence (less than 6 hours of father-child interaction per week), and high father presence (more than 2 hours of father child interaction per day). The parameters of IQ, and SES were used for subject matching. An

expected hierarchy between the groups was found in the scores, with the high father present group scoring best on most measures of cognitive performance, and the early father absent group scoring the lowest.

Another well controlled study of 286 father-absent and 57 father-present elementary school aged children (Santrock, 1972) looked at the relationship of the age of onset of father absence, as well as the precipitating cause of the father absence. The SES of the sample was predominately lower class and the father present control group was matched in this respect to minimize its possible effect on the findings. Father present boys and girls had higher scores on the Stanford Achievement test and the Otis quick Scoring IQ measure than father absent subjects. The age period of father absence most associated with poor performance was 0 - 2 years, for boys, and 0 - 5 years for girls. Santrock noted that boys whose father's died early, during the 0 - 5 period, scored higher than those whose fathers were absent due to divorce, desertion, of separation during the same period fo time. In contrast, boys whose fathers died later, during the ages of 6 - 9, scored lower than boys who became father-absent because of divorce, desertion, or separation during that same time period. This would suggest that the accompanying stressors of marital break up during a child's early years contribute to lower achievement on cognitive measures , and that paternal death during middle childhood exerts a similar effect. However, some additional situational variable may be present for the children who

experienced an early death of their father which would explain their tendency to perform better than children from father present homes on some of the cognitive measures. Santrock speculated that the families in which the father died when the child was very young may have experienced some variable that compensated for the loss of the father. Perhaps a concerted effort by the mother to compensate for the father and to overcome in the face of a tragic situation.

Radin (1973) conducted a prospective study that compared father-child interaction and changes in IQ over a one year period. She noted that the degree of paternal nurturance observed during the preschool age was predictive of IQ gains one year later. Broman et al., (1975) noted similar findings in a large longitudinal study of 26,760 children who were followed from the perinatal period through age eight. These researchers looked at 169 variables for correlates with preschool IQ scores. Among the highest correlates was the maternal education and SES. Marriage and the presence of a father in the home during the prenatal assessment was also significantly related to higher scores on later IQ measurements. They noted that this effect was more evident in the middle to upper socioeconomic groups.

Clarke-Stewart (1978), in a study described earlier, found that higher levels of paternal involvement in play, among other variables, were closely associated with higher IQ scores among children. This study displayed that in addition to findings of other researchers that showed that the presence or absence of the father has an impact on cognitive

development, the degree of paternal involvement and stimulation is also an important factor.

Pedersen et al., (1979) studied 55 black 5 - 6 month old infants recruited from an inner city well-baby clinic. "Male infants who had minimal interaction with their fathers were significantly lower on the Bayley Mental Development Index" and in other measures of responsiveness (p. 51). Female infants seemed unaffected by paternal presence or absence. A pattern emerges that male children in general are affected (cognitively) to a greater degree by father deprivation than female children.

In some more recent studies the effects of paternal absence or uninvolvement, the same trends are noted. Fry (1983) utilized subject matching of 70 father present and 70 father absent elementary aged children with regard to variables such as IQ differences and SES. Fry noted that father absent children displayed "less productive cognitive skills and fewer social-cognitive competencies" (p. 117). Bradley et al., (1984) in a controlled longitudinal study of 58 black families noted lower IQ scores of two year olds from one parent families when compared to two parent families.

A study of the interaction of biological risk factors (low birth weight) and various social risk factors (including father absence) was done by Ricciuti & Scarr (1990). Data from an entire population of 1,044 two year olds on the island of Bermuda was analyzed. Nearly all the two year olds on the island were included in the study. Using the Bayley Scale of Mental Development as a dependent measure, it was

found that predicted lower scores were achieved at age two by the low birth weight children. It was noted that this effect could be minimized or eliminated by the presence of the father in the home environment. So it was hypothesized that the presence of the father in the home may reverse or mitigate some of the negative affects of 'biological' risks, such as below-normal birth weight.

Mulkey et al., (1992) conducted a study of 15,000 high school students and their grades. They used sophisticated statistical tests to subtract the effects of race, paternal education and SES. Father absent students' grades were .27 standard deviations below father present students. However, when the statistical controls for race, SES, and paternal education were used to adjust the data, only .13 standard deviations could not be accounted for by the aforementioned variables.

The negative effect of father absence on cognitive development has not been identified universally in every study. In a study of 1,774 Goldstein found no significant differences between father absent and father present subjects. Data was obtained from Health Examination Surveys conducted by the National Center for Health Statistics from the periods of 1963-1965 and 1966-1970 and was collected first between the ages of 6-11 years, and again between 12-17 years. One particular flaw in the design was the operational definition of father absence. A child was noted to be father absent if they were living in a mother-only home at the time of both measurements. Earlier studies noted above have

identified the most salient period for father absence impacting cognitive development as 0-2 or 0-5 years of age. Data from the Goldstein sample did not differentiate if the father absence began just before the first measurement (at age 6-11) or much earlier, and whether the father absence was continual between the two measurements. The author does admit that as a whole, the youth who did not have fathers had mean scores lower than the father present group, but that the difference was not significant.

While appreciating the large sample of this study, it is important to view it in the larger context of all the studies to date. When several studies utilizing various methodologies and measurements provide results that consistently point in the direction of a negative effect on cognitive development, one must view the results of isolated contradictory studies with caution.

Over the years, several researchers have undertaken periodic reviews of the research (Johnson, 1993; Lamb, 1981a, 1986; Lamb & Stevenson, 1978; Pedersen, 1980; Radin, 1986; Russell & Radojevic, 1992; and Shinn, 1978). These reviews support the belief that the sum of the research points to a specific negative effect on cognitive development for father absent children. Each may vary on their assessment of the degree of impact that father absence exerts, however the direction of effect is agreeably the same. Shinn (1978), in a comprehensive review of 58 studies considered only those studies which were well controlled. She defined controlled studies as those which used 1) non-clinical populations, 2) a

father-present control group, 3) and controlled for SES by either matching subjects or stratifying the sample in analysis or selecting subjects from homogeneous backgrounds. Of the 58 studies, only 30 met these criteria. Of these, a majority revealed a negative cognitive effect to the variable of father absence. Radin (1981) suggests that perhaps some "of the information about the father's influence on the cognitive competence of the child is contradictory... as a result of the different samples and methodologies employed" (p.384).

Cumulative Effects of Father Absence

In the study conducted by Fry (1983) an examination was made of the correlation between the number of years of father absence and the various measures of social-cognitive development. The findings suggest that the effects of father absence on cognitive development were cumulative, and that the longer the duration of father absence, the greater the effect. Deutsch and Brown (1964) noted lower levels of intellectual achievement in father absent children when measured at fifth grade than was evident in the same children in a first grade measurement.

Male-Female Differences in Cognitive Styles

The effects of father absence on the cognitive development of boys and girls seems to be different in nature. It was pointed out earlier that males tend to be

affected more significantly by father absence than females in terms of cognitive measurements. Some studies have revealed that boys that have partially involved or at least present fathers tend to develop a more masculine cognitive style, and girls who lack paternal influence score slightly lower on measures of math and analytical abilities (Blanchard & Biller, 1971; Deutsch & Brown, 1964; Landy et. al, 1969; Radin & Russell, 1983; Santrock, 1972). The masculine cognitive approach "involves disembedding details of a problem from its context or ignoring irrelevant cues in the environment in solving certain types of problems" (Radin, 1981, p. 384). This style of cognition "has been shown to be related to mathematical and spatial ability" (Radin & Russell, 1983, p. 196). The more feminine cognitive approach is some times referred to as a 'global' or 'field dependent' style of thinking. In this female style of cognition "details of a problem are not disembedded from the context" (p. 196).

This difference in cognitive style has been noted in some studies that have shown higher quantitative (math) scores in father present children, both males and females (Landy, et al., 1969; and Sutton-Smith et al., 1968). In these same studies, there is evidence that males from mother-only homes may exhibit slightly lower quantitative skills and also higher verbal scores than father present males. This difference is thought to reflect an adoption of a more feminine style of thinking. Pedersen, et. al (1979) claim to have identified differences of cognitive styles as early as

5 - 6 months of age, and that these differences where correlated with father presence. Shinn (1978) cites several other studies that seem to support this pattern of masculine thought being mediated by the presence or involvement of the father.

Determinats of Cognitive Ability

Cognitive performance is presumed to measure, at least in part, the degree of cognitive development that has preceded it. Cognitive development, viewed from a Piagetian perspective, identifies finite stages or milestones of understanding and reasoning abilities that are displayed in a predictable order (Wadsworth, 1979). Behaviorists, on the other hand, see learning as the result of operant conditioning, or stimulus and response (Mott, Fazeka & James, 1985, p. 196). An implicit assumption is made that a child's environment makes a separate and distinct contribution to cognitive development. This is not to suggest that heredity does not play a significant role in determining cognitive abilities, or that there is not an interaction of genetics and environmental factors. The proportions of cognitive ability that are attributable to environment or heredity is debatable.

Historically, early developers of IQ tests considered intelligence stable and unchangeable (Brody, 1985). In the second half of this century the potential malleability of intelligence was demonstrated and the influence of environment as a determinant of intelligence was beggining to

be appreciated (Brody, 1985). Since then, another viewpoint has been proposed. It theorizes that heredity and environment interact at different points in development to affect cognitive abilities. This viewpoint is referred to as interactionism (Anastasi, 1958; Bouchard & Segal, 1985; McCall, 1976, 1979). In any case, the debate between heredity and environment will not be solved here. Although heredity contributes a large share to intellectual abilities, environment does as well, perhaps in an interactive fashion that we do not yet fully appreciate.

The effects of environment were examined by Ricciuti & Scarr (1990) in a study of infants at risk for lower cognitive outcomes. They found higher cognitive abilities in those infants (at 2 years of age) who were raised in home environments that provided greater stimulation. The notion that the environment of a child moderates the level of cognition which a child can attain is the basis for studying the impact of father absence and father involvement.

The Confluence Model and Father Absence Effects

Some authors of literature and research concerning the father-child relationship point to the need for a conceptual model from which to understand, analyze, and explain paternal effects on child development (Pedersen et. al, 1979). No all-encompassing theory was identified in the literature search performed for this thesis. One model was identified, however, that does explain in theory why the absence of one parent would result in reduced cognitive development, it is

called the confluence model.

This study is based the conceptual framework of the confluence model. According to Zajonc (1976) "The basic idea of the confluence model is that within a family the intellectual growth of each child is dependent on that of all the other members (of the family). Different family configurations constitute different intellectual environments" (p. 227).

Zajonc derived a formula used to calculate the intellectual environment (IE) of a child, which can be summarized by the following equation: A + A + C / 3 = IE, where "A" refers to the intellectual contribution of each parent (adult), "C" refers to the intellectual contribution of the child, the numeral (in this case, "3") refers to the total number of members in the family, and IE (the sum of the equation) refers to the intellectual environment to which the child is exposed.

To illustrate this concept Zajonc provides this example. If the "intellectual levels of the parents are 30 arbitrary units each, and a new born baby is zero units", then the intellectual environment for the child has a value of 20 units. This can be displayed by the following equation: 30 + 30 + 0 (=60) divided by the number of family members (three) / 3 = 20 intellectual units. "If a second child is born when the first child is still small and has only 4 units, then the subsequent child is in an intellectual environment of only 16 units (30 + 30 + 4 + 0) /4 = 16)"(p. 227). By this formula, children born closely together, or families with numerous

children, or children who lack two adult parents will have a lower intellectual environment. In accordance with these concepts, as Zajonc observed, if one adult parent is taken out of the equation, then the total intellectual environment for the child is reduced.

The confluence model was proposed by Zajonc & Markus (1975) as a means of interpreting and explaining the provocative findings of Belmont & Marolla (1973). Belmont & Marolla had analyzed the intelligence performance of nearly the entire population of 19 year olds who were born in the Netherlands from 1944 to 1947. They discovered a significant birth order effect on IQ scores. Sequentially born siblings were noted to have lower average scores on a test of intelligence. After the data was broken down by SES, both birth-order and family-size effects were still noted.

In 1976, Zajonc tested the confluence theory on data from three other large populations in addition to the data from the Belmont & Marolla study. The first population consisted of 800,000 candidates who took the National Merit Scholarship Qualification test. His data showed findings similar to that of Belmont & Marolla (1973). Scores generally declined with increasing family size, and with later position in birth order (Zajonc, 1976).

Zajonc also examined data from two other large studies that measured intellectual performance and collected data on family configurations. Data from a Scottish sample of 70,000 11 year olds, and a French sample of 400,000 6 to 14 year olds were analyzed. When intelligence scores were plotted in

terms of their standard deviations from their sample means, birth order and family size effects were still found. This despite the fact that the data was stratified according to SES.

Zajonc (1976, 1983) cautioned against viewing the confluence model as a static formula which could be applied individually on every family. It is an effect that is apparent only in aggregate data of large samples. He acknowledges that families have complex social processes that may vary between individual family units. Also, the intellectual environment present at any one point in a child's life is not static, but rather the IE changes dynamically as additional children (or adults) are added or subtracted from the family over time.

Fowler & Richards (1978) tested the confluence model by looking at the educational preparedness of lower income black children from father present and father absent families. The results of that study provided limited support for the validity of the confluence model as it relates to father absence. These researchers admittedly failed to control for the variables that frequently accompany and confound father absenc effects, such as divorce, marital discord, and death. They acknowledged that these variables exert a "profound change" in the parent-child relationship, as well as bring about concurrent social and emotional problems. Because of these uncontrolled intervening variables, their study may have been a poor test to validate the confluence model.

Brackbill & Nichols (1982) conducted a review of data

collected on a northeast urban population of expectant mothers which followed the children born to the expectant mothers for eight years. (The original purpose of the study was to look at the effects of adverse prenatal and perinatal events on subsequent neurological and cognitive development.) The sample was large, 53,000 children, but was disproportionately representative of racial minorities and lower SES groups. Brackbill & Nichols noted that father absence was "highly significant" in terms of a negative effect on cognitive performance. However, when they applied statistical controls to subtract the effects of SES differences, the correlations were "significantly reduced." Based on these results the authors suggested that the confluence model was not supported by their data.

The reliability of the findings of this study are questionable. First, their population of urban, racial minorities may not be representative of larger populations. Cultural differences in the role of the father may exist in some minority groups or lower SES populations. Fathers in these settings may assume a less significant role in their child's nurturance and education.

Another issue to consider when interpreting Brackbill & Nichol's findings has to do with the timing of measurements. Their conclusions were based on cognitive scores acquired at age seven. Zajonc (1983), in a rebuttal to the Blackbill & Nichol's study, pointed out that because the confluence model predicts a changing or dynamic process, measures at one point in mid-childhood can be misleading. The ultimate outcome in

intellectual development is a function of the changing intellectual environment equation over the child's total upbringing. It is dynamic, and not a static process. He uses the example of compound interest in a bank to illustrate his point. The amount of money in a bank that grows at a specific rate, if compounded over the years, does not represent a linear gain. Zajonc also points out that the confluence model can predict brief drops in IE in the middle aged years, when other children are added to the family, but that this drop in the IE is not permanent but will change as all the family members become older. Based on this analysis, the confluence model has not been disproven.

Two studies (Bradley et al., 1984; Fry, 1983) that used the confluence model as a framework for their research supported the tenants of the model. Bradley et al., (1984) in a well controlled study looked at the home environment of 58 families and noted that father absence, as one of the measures of home environment, was differentially related to the IQ's of three year olds. Fry's longitudinal study (1983) looked at 200 urban and rural elementary students and used SES and verbal intelligence scores to form matched pairs. His findings also supported the confluence model. Fry concludes that since "the father is one member of the family who has relatively higher mental age and therefore contributes significantly to the social cognitive development of children it may be argued that father absence during the early formative years may be more detrimental than during the later years" (p. 118).

The confluence model has logical and empirical evidence behind it. Its tenants cannot fit every family because individual families vary greatly. However, examined in the aggregate, the model seems stable, and can be a basis for understanding and interpreting the findings of the research in the field of paternal influence in child development.

Based on the confluence model, it would be predicted that father absence will result in a reduction of the absolute intellectual environment for the young child. Other processes may also potentiate or mitigate the effects seen with father absence. For instance, maternal stress is likely to occur with father absence, which may affect the nature and quantity of mother-child interactions, and the presence of extended family, or substantial exposure to other adult males. These issues are not the focus of this research project and could be investigated by additional studies. However, these issues are important as intervening variables that impact on cognitive development.

Summary

Our current cultural beliefs and understandings of the role of the father in early child development tend to relegate fatherhood primarily to a role as economic supporter of the family, and an emotional supporter (or helper) of the mother. Fathers are generally not seen as a unique or necessary contributor to the development of infants or young children. As a result of earlier societal trends or beliefs and unfounded scientific conclusions that the mother is the

only important figure in the life of a very young child, researchers initially focused predominately on the maternal role. Spurred by new societal changes in the role expectations of fathers, a growing body of research is beginning to reveal that the father is not an insignificant contributor to early child development. Fathers are noted to interact with their infants in qualitatively different ways than mothers. Numerous correlational studies, while limited in their ability to explain phenomenon, have revealed that the degree of father involvement is significantly related to developmental outcomes, and specifically of concern in this research, cognitive development.

This pilot study was designed to test methodology to examine potential father absence effects on the cognitive performance of two year olds from military families. Military families present a unique environment on which to study the affects of father absence. Whereas father absence in the general population is typically due to marital discord and break up or paternal death, in the military setting father absence is usually the result of situations outside the control of the family. When father absence occurs in the military, certain confounding variables such as changes in the family's SES, and marital discord are typically not present.

Methodology can greatly influence the outcome of research, and the conclusions that can be made from it. The following chapter will describe the methodologies used in this study.

CHAPTER THREE: METHODOLOGY

Introduction

The purpose of this research was to test the methodology utilized in this pilot study. Methodology used in any research has great bearing on the validity and interpretation of the results. The specific methodologies used in this pilot study will be described in this chapter. First, a description of the general design and its limitations, as well as a specific delineation of the conduct of the study. Next, a discussion of the protection of human rights. Finally, the rationale for instrument selection and its reliability and validity will be presented.

Research Design

A comparative descriptive research design is employed in this pilot study. This design describes differences or qualities noted in one group. It does not explain why those differences or qualities exist, in essence, cause and effect relationships cannot be determined from this design. However, as a result of this approach, insights into the relationships of certain variables can be hypothesized and can lead to future recommendations for research.

Sampling

Initial Proposal

Convenience sampling was utilized to obtain a group of father absent two year old children. The proposed sampling strategy for this pilot study was designed to achieve a fairly representative sampling of active duty families. The strategy was to recruit two year old children from a pediatric clinic at a large Eastern Naval medical center. An assumption was made that all two year old children were required to be seen for a scheduled two year old well-child assessment, as part of normal routine preventative health care provided by the clinic. Since all children were required to obtain these well-child assessments at regular intervals, it was assumed that this methodology would have resulted in an even distribution of families from various military ranks (and SES levels). The goal was to have 20 subjects.

Final Proposal

In the beggining of the study it was discovered that the pediatric clinic at the data collection site had recently discontinued routine screening at the two year old level due to limited resources. It was then discovered that a small group of em paneled pediatricians had begun providing some well-child two year old assessments, but the numbers of potential study participants were small. In order to compensate for this deficiency in available subjects the

collection strategy changed.

Subjects were recruited using a widely circulated flyer, and by the researcher approaching the parents of two year olds in the pediatric clinic waiting area. Flyers were placed at pediatric clinics at the Naval facility, the Uniformed Services University of the Health Sciences, Bethesda, Fort Meade, and Andrews AFB, as well as at the child care centers on these installations. Four out of five of the subjects were responders to the flyers.

Subject recruitment and data collection was conducted over a three week period in March, 1996. A total of five qualified subjects were obtained, four girls and one boy. Criteria for inclusion included: (1) subjects had to be between 24 and 36 months of age, (2) the subjects had to be free of any chronic or major illnesses, and (3) the child's military father would have to have been geographically separated from his family as a result of military deployment for a minimum of three continuous months during the child's first two years of life.

Steps in Data Collection

Interested parents called a phone number on the flyer to schedule the testing session. One and a half to two hours was allowed for each session, but only 45 to 60 minutes was required. Two client families failed to show up for their appointments and therefore did not become subjects in the study.

The mother brought in the child to the clinic and was

given a brief description of the study's aim, and the nature of the CAS test. After any questions or concerns were addressed the parents were asked to sign a consent form (see protection of human subjects). A referral policy was described in which any child who scored below the fifth percentile on the test would be referred to a developmental pediatrician at the institution for additional evaluation. In addition to the consent, parents were given a questionnaire (see instrumentation) which elicited demographic data. During this time the researcher slowly began to communicate and play with the child to allay his or her anxieties with the unfamiliar environment before the testing was begun.

The CAS was then administered to the child. According to testing manual instructions the researcher's administration of the exam was piloted on other children before actual data collection was begun under consultation with a developmental pediatrician who was familiar with administering the CAS. The researcher was the only individual doing the testing. This reduced the potential error for differences between raters. Testing of each subject took roughly 30 to 45 minutes. No significant interruptions or problems were encountered during the testing sessions, which were conducted in a moderately sized room that contained a small children's table and chairs. Parents were present during the testing.

Protection of Human Rights

The proposal for this study was reviewed and approved by the institutional review board (IRB) of the military facillity, as well as the committee for the protection of human subjects. Participation was optional and subjects could withdraw at any time without repercussions. Risks were delineated as "mild anxiety for the child due to meeting and interacting with an unfamiliar health care provider. Children may experience mild anxiety when asked to identify objects or concepts that they have not yet learned or been exposed to." Benefits included early identification of potential developmental delays which might require further evaluation by the pediatric staff. The sub-scales of the CAS allowed the examiner to help the parent identify their child's strengths and areas in which the parent could concentrate on more stimulation. Parents were instructed that their decision to participate would not affect their care at the clinic. There were no financial benefits or costs to participate. Confidentiality was maintained and subjects were tracked and identified by an assigned case number. When fully satisfied, parents were asked to sign a consent that delineated the points just covered. Finally, parents were told the study findings were to be shared with those parents who expressed interest, by self addressed envelopes.

Instrumentation

Demographic Data Collection

Demographic data were elicited and recorded on a questionnaire that was completed by the parent who brought in the child (the mother in each case). A sample of this data collection tool is present in the appendix: Parent questionnaire/Data collection form. It elicited the following information: the child's sex, birth date, whether the child had any major or chronic illnesses, the length of father absence, the timing of the father absence (predominately in the first year, second year, or evenly split), the father's military rank and years of service, whether the mother was employed outside the home, the highest educational level attained by each parent, and lastly, the ages and genders of any siblings.

The rationale for eliciting the child's sex is important because some research has noted that boys are affected more significantly by father absence than girls (Pedersen et al., 1979; Santrock, 1972; Solomon et al., 1972). The minimum length of father absence was set a three months out of convenience because this is a common length of deployment in the military. Temporary absence was chosen because most previous research had looked at permanent father absence while few studies had attempted to ascertain whether limited, temporary absence was associated with negative cognitive outcomes. The variable of father absence timing was important to include because one earlier study had noted the

most critical period for father absence as being between birth and age two (Santrock, 1972). Other studies had localized the most significant period as between birth and age five (Blanchard & Biller, 1971; Tarantino & Loricchio, 1989). No research had addressed the question of which of the first two years was most salient. The variable of maternal employment was recorded, but not controlled for, in order to enlarge the size of the sampling pool. The level of parental education was elicited because it has been shown to be related to' IQs (Broman et al., 1975) and could be examined for possible explanation of spurious findings. Finally, the number of siblings has significance as it relates to the confluence model. According to the model, not only does the number of parents impact on intellectual development, but also the number, spacing, and ordinal position of the siblings (Belmont & Marolla, 1973; Zajonc, 1976, 1983; Zajonc & Markus, 1975).

The Cognitive Abilities Scale (CAS): Development and Testing

The Cognitive Abilities Scale (CAS), a standardized test developed by Bradley-Johnson (1987), was used to measure the dependent variable of cognitive performance. The test was designed to be used on two to three year old children. The CAS was intended to measure the abilities or skills that would be necessary for future success in school and is useful in identifying areas in which a child needs further preliminary learning. For instance, a child may perform well on language/vocabulary items, but may be lacking in an

understanding of position words such as more, fewer, same, and different. As a result of the test's breakdown of different domains, such as language and quantitative skills, it is possible to examine potential differences in cognitive styles of children.

The CAS was developed in order to fill a gap in existing cognitive tests referred to as the "Bayley - Binet gap" (Madison & Adubato, 1983). Test items used in the *Bayley Scales of Infant Development* were primarily designed for use in the two and under age group, while the *Stanford-Binet Intelligence Scale* was noted to contain too few items geared to the skills of two to three year old children. Bradley-Johnson (1987) explains:

> One reason the problem exists [the Bayley - Binet gap] is that items for 2-year-olds are at the bottom of the scale on the Binet, while on the Bayley these items are at the top of the scale. Because of this situation there are not enough items to sufficiently sample behavior for children at the age range of 2 - 3. Thus, it is often difficult to obtain a standardized score to describe the cognitive development of many young children (p. 2).

As a result of this gap, the CAS was developed. Numerous test items from eighteen other measurement scales were analyzed for content validity and appropriateness for two to three year old children. Selected items were accepted or modified and incorporated into the new test. Next, the

CAS was field tested several times (Bradley-Johnson, 1984; Doty, 1986; Stewart, 1984). Each time items were analyzed to ascertain if they measured the target constructs reliably. Items were deleted or modified as needed.

Finally, content validity, "the extent to which the test results are related to another measure that is considered of value" (Gronlund, 1985) was assessed by comparing the CAS to the Stanford-Binet and the Bayley tests. When the CAS was given to two year olds and compared with results from the Stanford-Binet Intelligence Test, a correlation coefficient of .79 was found (Doty, 1986).

Construct validity was measured by Bradley-Johnson (1987), as part of the normatization/standardization of the CAS on 536 subjects. The raw scores of the CAS sub tests were inter correlated with the total scores and were significant at the .01 level.

Predictive validity was determined by giving the CAS to two year olds, then repeating the CAS at three years of age, and also comparing the initial scores with the scores later obtained on the Binet at age three. The CAS given at two years of age was predictive of the three year scores with a correlation of .66 ($p < .003$). The two year CAS scores also showed a predictive correlation with the three year Binet scores of .59 ($p < .01$).

As a result of the test being standardized, raw scores can be converted to standardized scores and percentile rankings. Percentiles and standardized scores can also be derived for each of the five sub tests (language, reading,

math, handwriting, and enabling behaviors). This allows for an examination of potential differences in cognitive styles.

The internal consistency between sub scales and the total scores on the CAS were calculated during the standardization process on 536 subjects. The coefficient alphas for the CAS given at age two was .97 (Bradley-Johnson, 1987). Test-retest stability was determined by Magiera (1986), and again during the standardization process (Bradley-Johnson, 1987). They were determined to be .97 and .99 respectively for the two year old subjects.

By using the CAS this researcher attempted to ensure a more accurate measure of cognitive development than is afforded by less precise screening tests like the Denver Developmental Screening Test (DDST). The CAS also allows the examination of language and math skills separately, as well as providing a global cognitive score.

Summary

The comparative descriptive design of this study carries significant limitations in its ability to identify cause and effect relationships. The need for a developmental screening test that was specific for measuring the cognitive performance of two to three year olds was necessary in order to investigate the topics in question and the conceptual model chosen. The CAS was designed to fill a gap in testing methods that existed for children in the two year old range. Validity and reliability were reasonably determined by the developer of the CAS as it was compared with two widely

utilized measures of cognitive performance.

CHAPTER FOUR: RESULTS

The purpose of this research is to pilot test a methodology to determine if two to three year old children from father absent military families score lower on the CAS than average children. This chapter will present the data obtained in this pilot study, and look at some of the variables measured during data collection.

Description of Sample

Pilot studies, by nature, are conducted in order to test a research design, methodology, measurement tool, or data collection process (Burns & Grove, 1993). This pilot study used a small purposeful volunteer sample rather than a representative or random sample, thus the data cannot be expected to answer the research questions initially posed. These factors must be kept in mind as the results of this study are examined.

As described previously, concessions were made in sampling methodology. Instead of a cross-section of all father-absent two year olds passing through a pediatric clinic, volunteers were used. Because of this compromise, the sample obtained was not representative of all military families, especially in a number of measured demographic variables.

The final sample of five children was disproportionately representative of girls, with four girls and one boy. The

ages of the children ranged from 25 to 36 months. The individual ages of the subjects (in months) were, 25, 27, 34, 34, and 36. All the subjects were reported by their parents to be free of major illness. All subjects met the criteria of having experienced a minimum of three months of father absence in the child's first two years of life. Three subjects were identified as experiencing father absence predominately during their first year of life, one during the second year of life, and one who experience equal periods of father absence over both years. Three of the subjects had mothers who were not employed outside the home, and two had mothers who were employed.

The number of years the fathers were in the military ranged from 3 to 12. The calculated base pay (a function of rank and years of military service) ranged from $ 39,110 to $ 53,448 per year. The mean income was $ 44,988 per year. This clearly placed all the families in the SES of middle-class.

Two of the most striking features of the sample were the military rank of the fathers and the levels of education of both the mothers and fathers. All the fathers were of 'officer' rank, and none were enlisted. Officers' ranks can be noted by a 'grade', 0-1 for an entry level officer, and 0-7 for General (called Admiral in the Navy). The fathers' rank (or grade) in the sample ranged from 0-2 to 0-4, with three of the fathers at the 0-3 grade.

All the fathers were college graduates. In addition, four of the five fathers held graduate level degrees. The

mothers had less college education than their spouses. One mother had completed two years of college. Three of the mothers had completed four years of college. One mother had attained a graduate level degree, and one was currently enrolled in a graduate program.

The number of siblings in each family varied: two subjects had no siblings; one had one older sibling; one had two older siblings, and one had four siblings (three older and one younger).

Understanding the Scores

The scores on the CAS are presented in standardized scores for the individual sub-scales on the test (language, reading, math, handwriting, and enabling behaviors). These were derived from raw scores on the CAS which were converted to standard scores using tables that were developed with the CAS. The sums of the standard scores on the sub scales were then converted to cognitive quotients, which represent a global index of the child's level of functioning. The average or mean cognitive quotient for the test is set at 100, with one standard deviation equal to 15 points on the scale. Average cognitive quotient scores fall between 90 and 110 (Bradley-Johnson, 1987).

The standard scores on the individual sub-tests are represented on a scale where the standardized mean is equal to 10, and one standard deviation is set at 3. According to Bradley-Johnson, 50% of the scores on each sub-test will fall between the scores of 8 and 12.

Results

The cognitive quotients of the subjects ranged from 108 to 113, with a mean score of 110.6. The one male subject scored a cognitive quotient (CQ) of 109, while the four females scored a mean of 111.

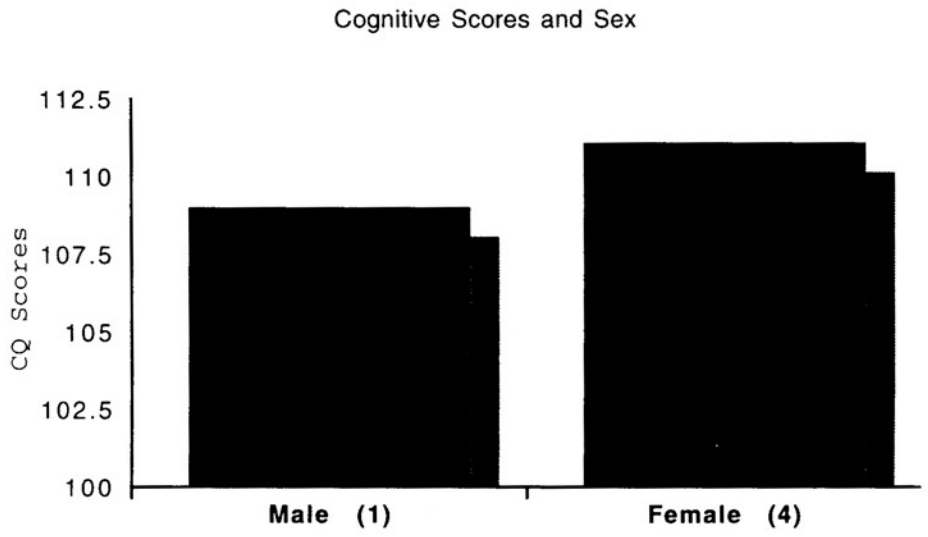


Figure 1. Mean cognitive quotients of males and females.

Subjects as a whole scored above average on all the sub-tests, except on the handwriting sub-test. Scores on the language sub-test ranged from 10 to 14, with a mean of 12. The reading sub-test results ranged from 11 to 15, with a mean score of 12.4. The math scores ranged from 10 to 13; mean at 11.6. Handwriting scores were the lowest of any of the sub-tests with a mean of 9.8 and ranged from 8 to 13..

However, three of the subjects scored 9 or lower, and one received a score of 13 on this sub-test. The final sub-test, labeled 'enabling behaviors', measured "abilities that are important for efficient learning"; "imitation of vocal and non-vocal behaviors", and recall of auditory information (p. 6). Scores on enabling behaviors ranged from 9 to 13, with a mean of 11.4.

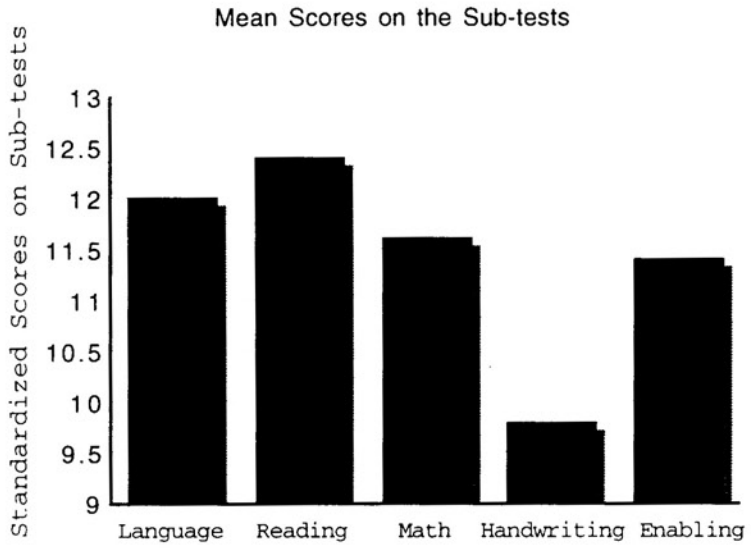


Figure 2. Mean scores on sub-tests for entire sample.

No statistical analysis was applied to the data to determine a level of significance since the sample size was so small. With a purposeful sample of only five subjects, the risk of a type I or type II error would be large. It is acknowledged that conclusions or inferences drawn from this

data would be inappropriate. Despite this limitation the following cursory observations were made without the assistance of statistical methods to ascertain their significance. These observations are reported in an effort to fully present the data obtained from this study and not to make conclusions.

When the cognitive quotients and the scores from the sub-tests were examined against the demographic data no striking dissimilarities were noted, except with respect to the variable of maternal employment and two of the sub-tests, handwriting and enabling behaviors. Children who had mothers that were employed (n=2) had a mean score of 11.5 on the handwriting sub-test, while children whose mothers stayed home to care for them (n=3) scored 8.7. However, on the 'enabling behaviors' sub-test, the results were reversed. The children of employed mothers scored lower on enabling behaviors, with a mean of 9, while the children whose mothers were full time care takers received a mean score of 13.

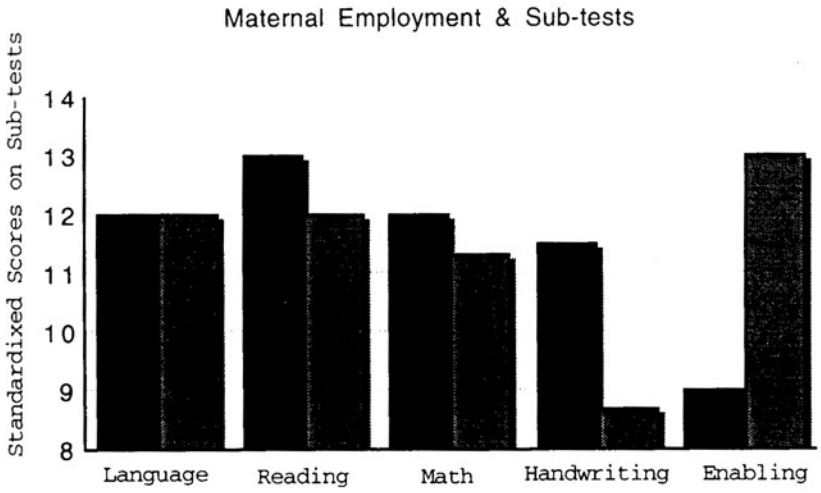


Figure 3. Maternal employment and mean sub-test scores. The mean scores of subjects with employed mothers are represented in black (n = 2). The mean scores of subjects whose mothers were not employed are represented by gray (n = 3).

With regards to paternal income, no pattern was noted in the data. Subjects from families with paternal incomes that ranked in the middle of the group scored higher. It must be noted that the range of incomes was relatively narrow.

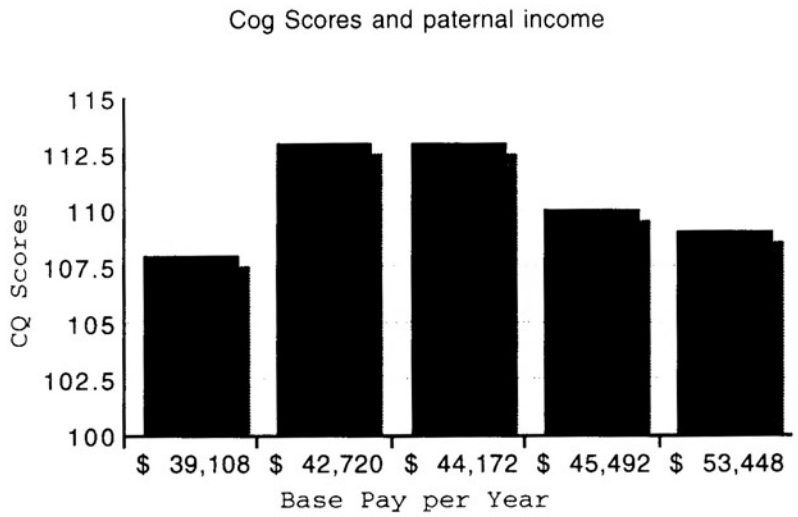


Figure 4. Cognitive quotients for each subject, according to paternal income (n = 1 for each column).

When examining the data in terms of family size (number of siblings), the subject who scored the highest also had the greatest number of siblings - four.

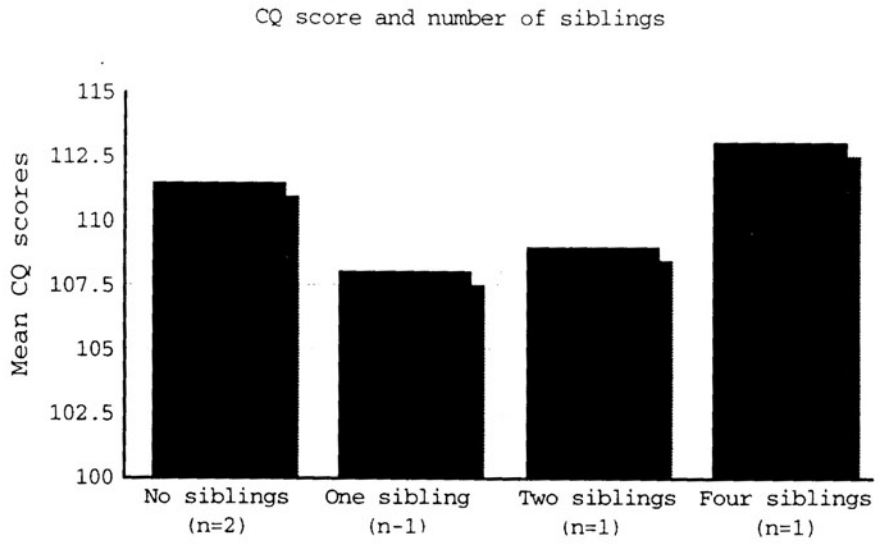


Figure 5. Cognitive quotients and number of siblings.

Summary

In summary, the father absent children (or families) sampled were relatively homogeneous. The sample subjects were predominately female (four out of a total of five subjects). The children sampled were characterized as having fathers who were military officers, and whose parents were college educated. All subjects scored above average on the overall cognitive abilities scale. Children whose mothers were employed performed better on the 'handwriting' sub-test, while children whose mothers stayed home performed better on the 'enabling behaviors' sub-test. Test scores revealed no patterns when viewed in terms of paternal income or family

size.

CHAPTER FIVE

Discussion of Problems Encountered in Pilot Study

The value of this pilot has been to identify the potential and real methodological difficulties that are incurred when attempting to study the effects of father absence in a military population. To this end, an evaluation of the methodology employed in this pilot is useful.

In viewing the methodological process - several observations were made. Three important difficulties were encountered. First, clearance through the IRB was delayed due to concerns about the sensitivity of the topic, and the potential significance of any conclusions. Second, the availability of potential subjects was impacted by unforeseen changes in the frequency of the clinic's routine screening of well children. As a result of these changes, it was necessary to alter the sampling strategy. These changes in sampling methods resulted in the final problem of a non-representative sample.

The process of obtaining approval through the institution's IRB was upheld by various concerns. One of the concerns expressed was over the small size of the proposed study. The original plan was for obtaining 20 subjects, 10 from father absent homes, and 10 from father present homes. Concerns were expressed that potentially invalid conclusions might be reached on such a small sample. Another concern was the sensitive nature of the issue of father absence in the

military. Military deployments which result in temporary father absence are an unavoidable consequence of military life. With this in mind, the issue became; what if temporary father absence does produce a negative effect on children? Since nothing can be done to avoid these circumstances, of what use is the study? A third concern was the question of what the potential implications of any significant findings would be. If father absence in the military was shown to be detrimental to children, what impact would that knowledge have on military families, and on military policies?

These issues lead to several changes in methodology. A smaller sample was to be obtained with a target of 10 to 20, and the use of a father present control group was abandoned. The research design was changed from one of a correlational study to one of a descriptive study. These changes weakened the significance of the findings.

Another problem evolved from the sampling methodology and the availability of father absent two year olds. The planned sampling site had stopped conducting two year old well child assessments prior to the start of the study. Participants comprised a convenience sample instead of randomly being assigned from a representative group of well two year olds. This change introduced sampling bias. Volunteer families may have had unique motivations to participate in the study. For example, parents may have been curious about their child's abilities, worried about potential negative effects of the paternal absence they had experienced, or simply wanted validation that their child was

normal or unaffected. Thus, these self selected individuals may have been qualitatively different from other military parents. It is possible that these parents were more acutely conscious of their child's developmental progress.

The final observation concerning the methodology used in this pilot study is that of a non-representative sample. The fore mentioned problems with IRB approval, and changes in subject availability, resulted in methodological compromises that limited the usefulness of any initial findings. Results from a non-representative sample cannot be generalized beyond the sample and are not useful in answering the research questions.

Some proposed solutions to these problems will be presented next. Following that will be a discussion of the implications of father absence to health care providers and the military community.

Recommended Changes in Methodology

The following section details some suggested solutions to the problems encountered in this pilot study. First, suggestions will be given that would address the concerns of the military community about research on such a sensitive issue as father absence; an issue over which the military may have little control. Second, alternative methods of sampling will be discussed. Future studies should employ sampling methods that result in less sampling bias. Finally, alternative research approaches will be discussed which would improve the predictive power and generalizability of

subsequent findings.

Measures to Address Institutional Concerns Regarding Research on Father Absence in the Military

First, concerns regarding the sensitive nature of father absence research in the military could be reduced by adopting a slightly different focus. The research goals could be broadened to identify factors or interventions that might mitigate or reduce the potential impact of father absence. Some of these factors might include: the presence of extended family in the child's home, participation of the family in community or social activities such as officers or enlisted wives clubs, youth programs, church activities, and the degree of connectedness the family has to an additional support networks such as family and friends.

Another approach might be to analyze what types of maternal behaviors foster cognitive development. Use of such information would be helpful in providing care to father absent families. For instance, mothers could be encouraged to incorporate some types of masculine patterns of infant stimulation noted in other research of father-infant interactions, such as increased physical stimulation in play or moving the child around in play situations. Utilizing this type of data or making it the focus in future studies would be useful in shifting the attention from the negative effects of father absence, to potential solutions.

An alternate approach could include a focus on the development (or piloting) of a screening process to permit early-identification of children with current, or the

potential for further developmental problems. For instance, mothers could be asked during clinic visits if the father was currently deployed. Further testing or parental education be provided. A focus on prevention, detection, and early intervention could serve to ameliorate concerns about the inherent negative connotations of father absence research. Selection of a dependent measure of cognitive development that is less intrusive and time consuming than the CAS would also be useful. If such a measure was tested in this population, and the feasibility of its routine use established, the conduct of such father absence research may be more acceptable to the military medical community.

Issues of Subject Availability

In order to ensure an adequate population of father absent military families from which to sample, future researchers will need to consider various factors regarding the proposed sampling site. What is the number of eligible families that utilize the services of the facility? What are the ages at which the institution routinely provides well child care? During which of these ages is collection of data most efficient and inclusive? Could a more easily administered cognitive measure be employed?

Measurement instruments such as the Minnesota Child Development Inventory (MCDI), or the Child Behavior Checklist (CBCL) could be easily completed by the parents. This strategy would allow a wider or more inclusive sampling of all the qualified participants at a given site. The less

intrusive nature of the checklists could reduce potential objections to participation in the study. One of the drawbacks of using parental reporting is that parents may inadvertently introduce other biases not present in a developmental test administered by a health care provider. Parents may not always accurately observe or report their child's behaviors. These limitations would have to be kept in mind if using these types of measurement instruments, and larger sample sizes may be required to off-set the drop in precision incurred with the use of a parental checklist.

Additional Methodological Suggestions to Insure Representative Sampling

The first and most important measure to reduce incorrect conclusions would be to include a control group of father present military children. They would need to be representative of similar backgrounds in relation to the experimental group of father absent children. Subjects would be matched on such characteristics as sex, SES, father's military rank (especially with regard to enlisted and officer ranks), family size, level of parental education, and maternal employment. This current pilot study did not have the benefit of a control group for reasons discussed previously. Inclusion of a control group in future studies would be of critical importance.

Another strategy to strengthen the study could be to change the research design to a prospective approach. Father present and soon-to-be father absent children could be measured before deployments, and again at some subsequent

point(s). Results of such an approach may more specifically measure father absent effects over time.

Finally, regardless of which of the above strategies were employed, data collection could include monitoring for other environmental factors. Factors such as: level of paternal involvement in play and care taking, extent of familiar and extra-familiar supports systems utilized by the families, and parental attitudes toward parenting and parental roles.

Clinical Implications of Father Absence and Cognitive Development

The phenomenon of father absence in the military (and in society at large) has various implications for health care providers. Based on a review of literature, father absence has the potential to negatively impact child development in various developmental areas, gender-role development, social competence, and cognitive development. Because father absence has been associated with negative outcomes, it is important for providers of health care to be aware of these potential effects when caring for father absent families. When caring for children, health care providers should make a conscious effort to carefully assess the cognitive functioning ability of children from father absent families, since they may be at increased risk for adverse effects. Alert providers may be able to identify those children who may be at increased risk and initiate early and timely interventions. Interventions could be as simple as educating the parents regarding the important contribution that fathers

provide to a child's development and to encourage fathers (when present) to become actively involved in interaction with, and care of their children.

When situations of father absence are unavoidable, as is the case in the military community, providers should encourage mothers to incorporate a more physical style of play which is typically provided by the father. Exactly just what types of physical interaction needs to be defined by future research. If future research indicates that certain factors may mitigate the impact of father absence (such as extended family, and participation in social groups) as suggested earlier in this chapter, these findings can be shared with parents, and those activities encouraged.

Finally, for those children who are identified as being at risk, or who are displaying signs of delays in cognitive development, early intervention services can be provided. Most states mandate and provide intervention services when developmental delays of a certain magnitude are recognized. By being aware of the potential effects of father absence, health care providers can insure that children who qualify for these mandated services and could benefit from them are identified, and given assistance when appropriate. For those parents of children whose delays are not sufficient to qualify for these programs, parental education about normal child development and age appropriate modes of stimulation should be provided as part of routine heath care visits. Mothers and fathers ought to be educated about the important role that involved fathers play in optimal child development.

REFERENCES

Anastasi, A. (1958). Heredity, environment, and the question "How?". Psychological review, 65 (4), 197-208.

Anderson, R.E.(1968). Where's dad? Paternal deprivation and delinquency. Archives of General Psychiatry, 3, 641-649.

Belmont, L., & Marolla, F.A. (1973). Birth order, family size, and intelligence. Science, 182, 1096-1101.

Biller, H.B. (1981). Father absence, divorce, and personality development. In M.E. Lamb (Ed.), The role of the father in child development (2nd ed.),(pp. 489-541). New York: Wiley & Sons.

Blachard, R.W., & Billner, H.B. (1971). Father availability and academic performance among third-grade boys. Developmental Psychology, 4 (3), 301-305.

Bolton, F.G., (Jr.). (1986). Today's father and the social services delivery system: A false promise. In M.E. Lamb (Ed.). The father's role: Applied perspectives (pp. 429-441). New York: Wiley & Sons.

Bouchard, T.J., Jr., & Segal, N.L. (1985). Environment and IQ. In B.B. Wolman (Ed.), Handbook of intelligence: Theories, measurements, and applications (pp. 391-464). New York: Wiley & Sons.

Brackbill, Y., & Nichols, P.L. (1982). A test of the confluence model of intellectual development. Developmental psychology, 18 (2), 192-198.

Bradley-Johnson, S. (1987). Cognitive abilities scale: An educationally relevant test for two- and three- year old children. Austin, TX: Pro-ed.

Brody, N. (1985). The validity of tests of intelligence. In B.B. Wolman (Ed.), Handbook of intelligence: Theories, measurements, and applications (pp. 353-390). New York: Wiley & Sons.

Broman, S.H., Nichols, P.L., & Kennedy, W.A. (1975). Preschool IQ: Prenatal and Early Developmental Correlates. New York: Wiley & Sons.

Burgner, M. (1985). The opedial experience: Effects on development of an absent father. International Journal of Psychoanalysis, 66, 311-320.

Burns, N., & Grove, S.K. (1993). The pracitice of nursing research: Conduct, critique, & Utilization. Philadelphia: Saunders.

Burton, R.V. (1972). Cross-sex identity in Barbados. Developmental Psychology, 6 (3), 365-374).

Chiland, C. (1981). A new look at fathers. Psychoanal. Study Child, 36, 367-379.

Clarke-Stewart, K.A. (1978). And daddy makes three: The fathers's impact on mother and young child. Child Development, 49, 466-478.

Clarke-Stewart, K.A. (1980). The father's contribution to children's cognitive and social development in early childhood. In F.A. Pederesen (Ed.), The father-infant relationship: Observational studies in the family setting (pp. 111-146). New York: Praeger.

Deutsch, M., & Brown, B. (1964). Social influences on negro-white intelligence differences. Journal of social Issues, 20, 24-35.

Doty, S. (1986). Development of a test of cognitive ability for two-year-old children: Pilot study. Unpublished master's thesis, Central Michigan University, Mt. Pleasant, MI.

Easterbrooks, M.A., & Goldberg, W.A. (1984). Toddler development in the family: Impact of father involvement and parenting characteristics. Child development, 55 (3), 740-752.

Field, T. (1978) Interaction behaviors of primary versus secondary caretaker fathers. Developmental Psychology, 14 (2), 183-184.

Fleck, J.R., Fuller, C.C., Malin, S.Z., Miller, D.H., & Ackerson, K.R. (1980). Father psychological absence and heterosexual behavior, personal adfustment and sex-typing in adoliscent girls. Adolescence, 15, 847-860.

Fowler, P.C., & Richards, H.C. (1978). Father absence, educational preparedness, and academic achievement: A test of the confluence model. Journal of Educational Psychology, 70 (4), 595-601.

Fry, P.S. (1983). Father absence and deficits in children's social-cognitive development: Implications for intervention and training. Journal of psychiatric treatment and evaluation, 5, 113-120.

Garbarino, J. (1993). Reinventing fatherhood. Families in Society, 74, 51-54.

Goldstein, H. S. (1983). Fathers' absence and cognitive development of children over a 3- to 5- year period. Psychological Reports, 52, 071-976.

Gronlund, N.E. (1985) Measurement and evaluation in teaching. New York: Macmillan.

Johnson, W. B.(1993). Father uninvolvement: Impact, etiology and potential solutions. Journal of Psychology and Christianity, 12 (4), 301-311.

Kotelchuck, M. (1976). The infant's relationship to the father: Experimental evidence. In M.E. Lamb (Ed.), The role of the father in child development (pp. 329-344). New York: Wiley & Sons.

Lamb, M.E. (1975). Fathers: Forgotten contributors to child development. Human development, 18, 245-266.

Lamb, M.E. (1977a). Father-infant and mother-infant interaction in the first year of life. Child Development, 48, 167-181.

Lamb, M.E. (1977b). The development of mother-infant and father-infant attachments in the second year of life. Developmental psychology, 13 (6), 637-648.

Lamb, M.E. (1981a). Fathers and child development: An integrative overview. In M.E. Lamb (Ed.), The role of the father in child development (2nd ed.),(pp. 1-33). New York: Wiley & Sons.

Lamb, M.E. (1981b). The development of father-infant relationships. In M.E. Lamb (Ed.), The role of the father in child development (2nd ed.),(pp. 459-479). New York: Wiley & Sons.

Lamb, M.E. (1986). The changing roles of fathers. In M. Lamb (Ed.), The father's role: Applied perspectives (pp. 3-27). New York: Wiley & Sons.

Lamb, & Stevenson. (1978). Father infant relationships: Their nature and importance. Youth and Society, 9, 272-298.

Landy, F., Rosenberg, B.G., & Sutton-Smith, B. (1969). The effects of limited father absence on cognitive development. Child Development, 40, 941-944.

Levine, J.A. (1993). Involving fathers in head start. Families in Society, 74, 4-19.

Madison, L.S., & Adubato, S.A. (1983). Bridging the Bayley-Binet Gap. Psychology in the schools, 20, 424-426.

McCall, R.B. (1976). A conceptual approach to early development. In Lewis, M. (Ed.), Origins of intelligence: Infancy and early childhood (2nd ed), (pp. 107-131). New York: Plenum Press.

McCall, R.B. (1979). The development of intellectual functioning in infancy and the prediction of later IQ. In J.D. Osofsky (Ed.). Handbook of infant development (pp. 707-715). New York: Wiley & Sons.

Mott, S.R., Fazekas, N.F., & James, S.R. (1985) Nursing care of children and families: A holistic approach. Menlo Park, CA: Addison-Wesley.

Mulkey, L.M., Crain, R.L., & Harrington, A.J.C. (1992). One parent households and achievement: Economic and behavioral explanations of a small effect. Sociology of education, 65, 48-65.

Osofsky, J. D. (Ed.).(1979). Handbook of infant development. New York: Wiley & Sons.

Papuosek, H., & Papuosek, M. (1975). Cognitive aspects of pre-verbal social interaction between human infants and adults. In Parent-infant interaction: Ciba Foundation Symposium 33 (pp.259). New York: Excerpta Medica.

Parish, T.S., & Nunn, G.D. (1983). Locus of control as a function of family type and age at onset of father absence. Journal of psychology, 113, 187-190.

Parke, R.D., & Tinsley, B.R. (1981). The father's role in infancy: Determinants of involvement in care giving and play. In M.E. Lamb (Ed.), The role of the father in child development (2nd ed.),(pp. 429-451). New York: Wiley & Sons.

Pedersen, F.A. (1966). Relationships between father absence and emotional disturbances in military dependents. Mirrill-Palmer Quarterly, 12 (4), 321-331.

Pedersen, F.A. (1980). Overview: Answers and reformulated questions. In F.A. Pedersen (Ed.), The father-infant relationship: Observational studies in the family setting (pp. 147-163). New York: Praeger.

Pedersen, F.A., Rubenstein, J.L., & Yarrow, L.J. (1979). Infant development in father absent families. Journal of Genetic Psychology, 135, 51-61.

Pedersen, F.A., Suwalsky, J.T.D., Cain, R.L., Zaslow, M.J., & Rabinovich, B.A. (1987). Paternal Care of infants during maternal separations: Associations with father-infant interaction at one year. Psychiatry, 50, 193-205.

Radin, N. (1973). Observed paternal behaviors as antecedents of intellectual functioning on young boys. Developmental psychology, 8 (3), 369-376.

Radin, N. (1981). The role of the father in cognitive, academic, and intellectual development. In M.E. Lamb (Ed.), The role of the father in child development (2nd ed.),(pp. 379-419). New York: Wiley & Sons.

Radin, N. (1986). The influences of fathers on their sons and daughters. Social Work in Education, p. 77-91.

Ricciuti, A.E., & Scarr, S. (1990). Interaction of early biologic and family factors on predicting cognitive development. Journal of Applied Developmental Psychology, 11, 1-2.

Robin, M. W. (1979). Life without father: A review of the literature. International Journal of Group Tensions, 1 (4), 169-194.

Russell, G., & Radojevic, M. (1992). The changing role of fathers? Current understandings and future directions for research and practice. Infant mental health journal, 13 (4), 296-311.

Santrock, J. W. (1972). Relation of type and onset of father absence to cognitive development. Child Development, 43, 455-469.

Seltzer, J.A., & Bianchi, S.M. (1988). Child contact with absent parents. Journal of Marriage and Family, 50, 663-677.

Shaw, J.A. (1987). Children in the military. Psychiatric Annals, 17 (8): 539-544.

Shinn, M. (1978). Father absence and children's cognitive development. Psychological Bulletin, 85 (2), 295-324.

Siegman, A.W. (1966). Father absence during early childhood and anti-social behavior. Journal of Abnormal Psychology, 71, 71-74.

Snow, M.E., Jacklin, C.N., & MacCoby, E.E. (1983). Sex-of-child differnces in father-child interaction at one year of age. Child development, 54 (1), 227-232.

Solomon, D., Hirsch, J.G., Scheinfeld, D.R., & Jackson, J.C. (1972). Family characteristics and elementary school achievement in an urban ghetto. Journal of consulting and clinical psychology, 39 (3), 462-466.

Stewart, L. (1984). Item analysis and construct validity for the test for three-year-olds-revised. Unpublished master's thesis, Central Michigan University, Mt. Pleasant, MI.

Sutton-Smith, B., Rosenberg, B.G., & Landy, F. (1968). Father-absence effects in families of different sibling compositions. Child Development, 39, 1213-1221.

Tarantino, S.J., & Loricchio, D.F. (1989). Field dependence, language ability, and self concept as a function of fathers' absence. Perceptual and Motor Skills, 69, 431-434.

U.S. Bureau of the Census. (1976). Current population reports: Household & family characteristics (series P-20 No. 291, March, 1975). Washington, DC: U.S. Government Printing Office.

Wadsworth, B.J. (1979). Piaget's theory of cognitive development: An introduction. New York: Longwood.

Yarrow, L.J., Rubenstein, J.L., & Pedersen, F.A. (1975). Infant and environment: Early cognitive and motivational development. (pp. 27-40, 69-95). Washington, D.C.: Hemisphere.

Zajonc, R.B. (1976). Family configuration and intelligence. Science, 192, 227-236.

Zajonc, R.B. (1983). Validating the confluence model. Psychological bulletin, 93 (3), 457-480.

Zajonc, R.B, & Markus, G.B. (1975). Birth order and intellectual development. Psychological Review, 82 (1), 74-88.

APPENDIX

Parent Questionnaire/Data Collection From

PARENT QUESTIONNAIRE / DATA COLLECTION FORM

Subject number:_____ (M / F)

1. What is your child's date of birth ? _____/_____/_____
month/ day / year

2. My child has been free of major illnesses in the past two years (yes/no)
(If not, please explain breifly.)

3. How many weeks or months has the father been absent from the home over the child's first two years of life, as a result of the father's military duties ? (Please **circle one**, and **note the length** of father absence below)

(Less than three months) (Greater than three months)

How long ?_____ (Was it continuous? Yes/no)

4. Please select (circle) one of the following statements that represents when the majority of father absence occurred in the child's life.

A. The father was gone mostly during the child's first year.
B. The father was gone mostly during the child's second year.
C. The father was gone about equally between the first and second year.

5. What is the rank (grade) of the child's father ? (circle one)

E - 1, 2, 3, 4, 5, 6, 7, 8, 9

O - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

6. How many years has the father been in the military ? _____ years

7. Has the mother been employed outside the home in the past two years? (y/n)

8. What is the highest level of education attended by the father ? (circle)

1	2	3	4	5
High School not completed	High School or EGD completed	Two years of College	Four years of College	Masters degree or higher

9. What is the highest level of education attended by the mother ? (circle)

1	2	3	4	5
High School not completed	High School or EGD completed	Two years of College	Four years of College	Masters degree or higher

10. How many brothers and sisters does your chid have? and what are their ages